

CLAIM AMENDMENTS

Please amend the claims by canceling claims 2, 3, and 42, amending claims 1, 14, 25, 36-41, 43-47, all without prejudice, as indicated on the following listing of all the claims in the present application after this Amendment:

1. (Currently Amended) A computer implemented method of simulating the effect of a load or other influence on a system based upon solving transient dynamic equations and obtaining static equilibrium solutions, the method comprising performing a finite element simulation comprising automatically switching between an implicit method of analyzing the effect of the load or other influence and an explicit method of analyzing the effect of the load or other influence two or more times during the finite element simulation.
2. (Cancelled)
3. (Cancelled)
4. (Original) The method of Claim 1 further comprising beginning the finite element simulation using the implicit method.
5. (Original) The method of Claim 1 further comprising beginning the finite element simulation using the explicit method.

6. (Original) The method of Claim 1 further comprising ending the finite element simulation if a solution to the finite element simulation is determined using the implicit method.

7. (Original) The method of Claim 1 further comprising ending the finite element simulation if a solution to the finite element simulation is determined using the explicit method.

8. (Original) The method of Claim 1 further comprising monitoring a number of iterations performed using the implicit method and automatically switching from the implicit method to the explicit method if the number of iterations exceeds a predetermined threshold number.

9. (Original) The method of Claim 1 further comprising monitoring the internal energy of the model during iterations of the implicit method and automatically switching from the implicit method to the explicit method if the internal energy exceeds a predetermined threshold number.

10. (Original) The method of Claim 1 further comprising monitoring a length of time the explicit method has been running and automatically switching from the explicit method back to the implicit method if the length of time exceeds a predetermined threshold time period.

11. (Original) The method of Claim 1 further comprising extending the termination time of the finite element simulation thereby forcing the finite element simulation to end using the implicit method.

12. (Original) The method of Claim 1 wherein the finite element simulation is used to simulate the formation of a metal shape.

13. (Original) The method of Claim 1 wherein the finite element simulation is used to simulate the springback of a metal shape.

14. (Currently Amended) A computer readable storage medium storing one or more computer programs for simulating the effect of a load or other influence on a system part by performing a finite element simulation, the computer programs comprising instructions for:

constructing a finite element simulation of the part;

analyzing the effect of the load upon the simulated part with an implicit method of

solution;

analyzing the effect of the load upon the simulated part with an explicit method of
solution; and

automatically switching between an implicit solution method of analyzing the effect
of the load upon the simulated part and an explicit solution method of analyzing the effect of
the load upon the simulated part two or more times during the finite element simulation.

15. (Original) The computer readable storage medium of Claim 14 wherein the computer programs further comprise computer instructions for beginning the finite element simulation using the implicit method.

16. (Original) The computer readable storage medium of Claim 14 wherein the computer programs further comprise computer instructions for beginning the finite element simulation using the explicit method.

17. (Original) The computer readable storage medium of Claim 14 wherein the computer programs further comprise computer instructions for ending the finite element simulation if a solution to the finite element simulation is determined using the implicit method.

18. (Original) The computer readable storage medium of Claim 14 wherein the computer programs further comprise computer instructions for ending the finite element simulation if a solution to the finite element simulation is determined using the explicit method.

19. (Original) The computer readable storage medium of Claim 14 wherein the computer programs further comprise computer instructions for monitoring a number of iterations performed using the implicit method and automatically switching from the implicit method to the explicit method if the number of iterations exceeds a predetermined threshold number.

20. (Original) The computer readable storage medium of Claim 14 wherein the computer programs further comprise computer instructions for monitoring the internal energy of

the model during iterations using the implicit method and automatically switching from the implicit method to the explicit method if the internal energy exceeds a predetermined threshold number.

21. (Original) The computer readable storage medium of Claim 14 wherein the computer programs further comprise computer instructions for monitoring a length of time the explicit method has been running and automatically switching from the explicit method back to the implicit method if the length of time exceeds a predetermined threshold time period.

22. (Original) The computer readable storage medium of Claim 14 wherein the computer programs further comprise computer instructions for extending the termination time of the finite element simulation thereby forcing the finite element simulation to end using the implicit method.

23. (Original) The computer readable storage medium of Claim 14 wherein the finite element simulation is used to simulate the formation of a metal shape.

24. (Original) The computer readable storage medium of Claim 14 wherein the finite element simulation is used to simulate the springback of a metal shape.

25. (Currently Amended) A computer system comprising:
one or more computers; and

one or more computer programs running on the computer(s), the computer programs for performing a finite element simulation, the computer programs comprising computer instructions for automatically switching between an implicit finite element simulation method and an explicit finite element simulation method two or more times during the finite element simulation.

26. (Original) The computer system of Claim 25 wherein the computer programs further comprise computer instructions for beginning the finite element simulation using the implicit method.

27. (Original) The computer system of Claim 25 wherein the computer programs further comprise computer instructions for beginning the finite element simulation using the explicit method.

28. (Original) The computer system of Claim 25 wherein the computer programs further comprise computer instructions for ending the finite element simulation if a solution to the finite element simulation is determined using the implicit method.

29. (Original) The computer system of Claim 25 wherein the computer programs further comprise computer instructions for ending the finite element simulation if a solution to the finite element simulation is determined using the explicit method.

30. (Original) The computer system of Claim 25 wherein the computer programs further comprise computer instructions for monitoring a number of iterations performed using

the implicit method and automatically switching from the implicit method to the explicit method if the number of iterations exceeds a predetermined threshold number.

31. (Original) The computer system of Claim 25 wherein the computer programs further comprise computer instructions for monitoring the internal energy of the model during iterations of the implicit method and automatically switching from the implicit method to the explicit method if the internal energy exceeds a predetermined threshold number.

32. (Original) The computer system of Claim 25 wherein the computer programs further comprise computer instructions for monitoring a length of time the explicit method has been running and automatically switching from the explicit method back to the implicit method if the length of time exceeds a predetermined threshold time period.

33. (Original) The computer system of Claim 25 wherein the computer programs further comprise computer instructions for extending the termination time of the finite element simulation if a solution is found using the explicit method thereby forcing the finite element simulation to end using the implicit method.

34. (Original) The computer system of Claim 25 wherein the finite element simulation is used to simulate the formation of a metal shape.

35. (Original) The computer system of Claim 25 wherein the finite element simulation is used to simulate the springback of a metal shape.

36. (Currently Amended) A ~~data signal embodied in a carrier wave computer readable storage medium~~, the ~~data signal computer readable storage medium~~ including one or more computer programs for performing a finite element simulation, the computer programs comprising:

instructions for automatically switching between an implicit method and an explicit method one or more times during the finite element simulation, and

instructions for monitoring the internal energy of the model during iterations using the implicit method and automatically switching from the implicit method to the explicit method if the internal energy exceeds a predetermined threshold number.

37. (Currently Amended) The ~~data signal embodied in a carrier wave computer readable storage medium~~ of Claim 36 wherein the computer programs further comprise computer instructions for beginning the finite element simulation using the implicit method.

38. (Currently Amended) The ~~data signal embodied in a carrier wave computer readable storage medium~~ of Claim 36 wherein the computer programs further comprise computer instructions for beginning the finite element simulation using the explicit method.

39. (Currently Amended) The ~~data signal embodied in a carrier wave computer readable storage medium~~ of Claim 36 wherein the computer programs further comprise computer instructions for ending the finite element simulation if a solution to the finite element simulation is determined using the implicit method.

40. (Currently Amended) The ~~data signal embodied in a carrier wave computer readable storage medium~~ of Claim 36 wherein the computer programs further comprise computer instructions for ending the finite element simulation if a solution to the finite element simulation is determined using the explicit method.

41. (Currently Amended) The ~~data signal embodied in a carrier wave computer readable storage medium~~ of Claim 36 wherein the computer programs further comprise computer instructions for monitoring a number of iterations performed using the implicit method and automatically switching from the implicit method to the explicit method if the number of iterations exceeds a predetermined threshold number.

42. (Canceled)

43. (Currently Amended) The ~~data signal embodied in a carrier wave computer readable storage medium~~ of Claim 36 wherein the computer programs further comprise computer instructions for monitoring a length of time the explicit method has been running and automatically switching from the explicit method back to the implicit method if the length of time exceeds a predetermined threshold time period.

44. (Currently Amended) The ~~data signal embodied in a carrier wave computer readable storage medium~~ of Claim 36 wherein the computer programs further comprise computer instructions for extending the termination time of the finite element simulation thereby forcing the finite element simulation to end using the implicit method.

45. (Currently Amended) The ~~data signal embodied in a carrier wave computer readable storage medium~~ of Claim 36 wherein the finite element simulation is used to simulate the formation of a metal shape.

46. (Currently Amended) The ~~data signal embodied in a carrier wave computer readable storage medium~~ of Claim 36 wherein the finite element simulation is used to simulate the springback of a metal shape.

47. (Currently Amended) A computer implemented method for designing a part, comprising:

performing a finite element simulation of the part, the method finite element simulation comprising automatically switching between

an implicit finite element simulation portion method and an explicit finite element simulation portion method

, the finite element simulation comprising an automatic switch between the implicit finite element simulation portion and the explicit finite element simulation portion if convergence of the solution in the implicit finite element simulation portion method is not achieved within a threshold amount of time or iterations.